

# Central Lancashire Level 1 SFRA - Appendix E

Local Plan Sites Assessment

**Final**

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Prepared for:



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# 1 Local Plan Sites Assessment

Appendix E provides a strategic assessment of the suitability, relative to flood risk, of the sites to be considered for allocation in the Local Plan, summarising the outcomes of the screening assessment spreadsheet in Appendix C.

The information and guidance provided in this Appendix (also supported by the SFRA Interactive Mapping in Appendix B) can be used by the LPA to inform the Local Plan and provide the basis from which to apply the Sequential Test in the development allocation and the development management process.

**The LPA must use Appendix C to record their decisions on how to take each site forward or whether to remove a site from allocation, based on the evidence and strategic recommendations provided in this Level 1 SFRA. Recording decisions in the Sites Assessment Spreadsheet demonstrates that a sequential, sustainable approach to development and flood risk has been adopted.**

The constituent Central Lancashire Authorities provided a GIS layer containing potential development site allocations. The total number of sites assessed was 403. The number of potential development sites within each constituent local planning authority is noted within Table 1-1.

Table 1-1: Number of potential development sites within each LPA

Local Planning Authority	Number of sites
Chorley	71
Preston	210
South Ribble	122

In order to inform the Sequential Test to the allocation of development through the Local Plan, this assessment entails a high-level GIS screening exercise overlaying the potential development sites against Flood Zones 1, 2, 3a and 3b (the functional floodplain), calculating the area of each site at risk. Flood Zones 1, 2 and 3 are sourced from the EA's Flood Map for Planning (Rivers and Sea). Flood Zone 3 is split into Flood Zone 3a and Flood Zone 3b (functional floodplain) as part of this Level 1 SFRA, as required by the National Planning Policy Framework (NPPF). The impacts of climate change have also been included in the sites screening process using the delineated Flood Zone 3b plus climate change outline and modelled 100-year flood event plus climate change. See Section 1.2 for details. All flood zones are displayed on the SFRA Interactive Mapping in Appendix B.

Surface water risk to assessed sites is analysed by way of the EA's national scale Risk of Flooding from Surface Water (RoFSW) dataset. The EA states that this dataset is not

suitable for identifying whether an individual property will flood. It is recommended that the RoFSW is not displayed on basemapping more detailed than 1:10,000 as the data is open to misinterpretation if viewed at a greater or more detailed scale. Because of the way the RoFSW has been produced and the fact it is indicative, it is not appropriate to act as the sole evidence for any specific planning or regulatory decision or assessment of risk in relation to surface water flooding at any scale without further supporting studies or evidence. The impact of climate change on surface water flood risk has also been considered within this site screening using modelled surface water climate change outputs based on the RoFSW methodology.

It is important to consider that each individual site will require further investigation, following this assessment, as local circumstances may dictate the outcome of the strategic recommendation. Such local circumstances are discussed in Section 1.1. The outcomes of the site assessments are presented in the Sites Assessment spreadsheet in Appendix C.

## 1.1 Screening of potential sites

This section of the report draws together the results included in the assessment spreadsheet (Appendix C), produced from a GIS screening exercise. The LPA should use the spreadsheet to identify which sites should be avoided during the Sequential Test. If sites cannot be directed to areas of low flood risk, or where wider strategic objectives require development in areas identified through this Level 1 SFRA to be at risk from flooding, then the LPA should consider the compatibility of vulnerability classifications and flood zones and whether or not a more detailed Level 2 SFRA (including for application of the Exception Test where applicable) will be required before finalising sites for allocation in the Local Plan. Strategic recommendations are based on Tables 1 and 2 of the flood risk and vulnerability tables<sup>1</sup> of the Flood Risk and Coastal Change Planning Practice Guidance (FRCC-PPG) (Paragraphs 077 - 079), and Annex 3 of the National Planning Policy Framework<sup>2</sup>.

The decision-making process on site suitability should be transparent and information from this SFRA should be used to justify decisions to allocate land in areas shown to be at high or medium risk of flooding.

The Sites Assessment spreadsheet provides a breakdown of each site and the area (in hectares) and percentage coverage of each fluvial/tidal and surface water flood zone. Fluvial/tidal Flood Zones 3b, 3a, 2 and 1 are considered in isolation. Any area of a site within the higher risk Flood Zone 3b that is also within Flood Zone 3a is excluded from Flood Zone 3a and any area within Flood Zone 3a is excluded from Flood Zone 2. This allows for the sequential assessment of risk at each site by addressing those sites at higher risk first. The effects of climate change on fluvial/tidal flood risk have been assessed additionally to existing risk. Table 1-2 shows the proposed use of the sites and the number

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1 [Flood Risk and Coastal Change Planning Practice Guidance | GOV.UK | August 2022](#)

2 [National Planning Policy Framework | GOV.UK | December 2023](#)

of sites within each fluvial/tidal flood zone and Table 1-3 shows the number of sites within each surface water flood zone.

Table 1-2: Number of sites at risk from fluvial flooding

Proposed Use	Number of sites within each Flood Zone				
	Flood Zone 1*	Flood Zone 2	Flood Zone 3a	Flood Zone 3b	Flood Zone 3b + climate change
Housing	269	45	24	69	22
Employment	25	2	2	6	1
Mixed Used	10	11	5	10	4
<b>TOTAL</b>	<b>304</b>	<b>58</b>	<b>31</b>	<b>85</b>	<b>27</b>

\*Sites with 100% area within Flood Zone 1  
 Note: sites may be in more than one flood zone. In reality, a site in Flood Zone 3a will also be within Flood Zone 2.

Table 1-3: Number of sites at risk from surface water flooding

Proposed Use	Number of sites within each surface water risk category		
	Low risk zone (1 in 1000)	Medium risk zone (1 in 100)	High risk zone (1 in 30)
Housing	271	223	198
Employment	29	29	26
Mixed Use	20	19	18
<b>TOTAL</b>	<b>320</b>	<b>271</b>	<b>242</b>

Note: sites may be in more than one surface water risk category. In reality, a site in the high risk category will also be in the medium and low risk categories.

The strategic recommendations are intended to assist the LPAs in carrying out the Sequential Test and to highlight those sites at greatest flood risk. Table 1-4 shows the number of sites each strategic recommendation applies to:

- Strategic Recommendation A - recommend for withdrawal unless risk area can be avoided;
- Strategic Recommendation B - Level 2 SFRA. Exception Test required if site is more vulnerable or essential infrastructure;
- Strategic Recommendation C - allocate and progress to developer-led FRA; and

- Strategic Recommendation D - development could be allocated on flood risk grounds based on the evidence of this Level 1 SFRA. LPA to make decision on allocation.

Table 1-4: Number of sites per strategic recommendation

Proposed Use	Number of sites assigned to each strategic recommendation			
	A	B	C	D
Housing	71	212	6	59
Employment	6	23	0	3
Mixed Use	10	11	0	2
<b>TOTAL</b>	<b>87</b>	<b>246</b>	<b>6</b>	<b>64</b>

It is important to note that each individual site will require further investigation before development is allocated, as local circumstances may dictate the outcome of the strategic recommendation. Such local circumstances may include the following:

- Flood depths and hazards will differ locally to each at risk site therefore modelled depth, hazard and velocity data should be assessed for the relevant flood event through a Level 2 SFRA;
- Availability of detailed climate change modelling;
- The RoFSW map is national scale and is not considered suitable for robustly identifying risk at the property level. For sites identified to be at medium or high risk from surface water based on the RoFSW, more detailed surface water modelling may reveal higher or lower risk to the site. The LLFA should be consulted when considering development viability at such sites;
- Current surface water drainage infrastructure and SuDS suitability are likely to differ at each site considered to be at risk from surface water flooding. Further investigation would therefore be required for any site at surface water flood risk. The LLFA should require that all planning applications must be accompanied by an appropriate drainage strategy, independent of the requirement for a site-specific FRA;
- If sites have planning permission but construction has not started, the SFRA will only be able to influence the design of the development e.g. finished floor levels. New, more extensive flood extents (from new or updated models) cannot be used to reject development where planning permission has already been granted;
- It may be possible at some sites to develop around the flood risk. Planners are best placed to make this judgement i.e. will the site still be deliverable if part of it needs to be retained to make space for floodwater? Yields may be impacted;
- Surrounding infrastructure may influence scope for layout redesign/removal of site footprints from risk;

- Some sites not currently at flood risk may be at residual risk through the failure of defences during a flood event or through blockage/failure of drainage assets such as culverts;
- Safe and dry access and escape routes must exist at all times during a flood event for emergency response and evacuation. Emergency Planners should be consulted and appropriate emergency plans put in place;
- Current land use. A number of sites included in the assessment are likely to be brownfield, thus the existing development structure and footprint could be taken into account as further development may not lead to increased flood risk; and
- Existing planning permissions may exist on some sites where the EA may have already passed comment and/or agreed to appropriate remedial works concerning flood risk. Previous flood risk investigations/FRAs may already have been carried out at some sites. The LPA should be consulted.

#### 1.1.1 Strategic Recommendation A - recommend for withdrawal unless risk area can be avoided

This strategic recommendation does not take into account local circumstances, only that part of the site area falls within a flood zone.

Strategic Recommendation A applies to any site where the following criteria is true:

- Any proportion of the site area is within the functional floodplain. The FRCC-PPG flood risk vulnerability classification states that only water compatible uses and essential infrastructure should be permitted in the functional floodplain, though any essential infrastructure must pass the Exception Test and water compatible uses must be designed and constructed to remain operational and safe for users in times of flood; must result in no net loss of floodplain storage; and must not impede water flows and not increase flood risk elsewhere. Development should not be permitted for sites within the highly, more, or less vulnerable categories that fall within the functional floodplain.
- Any proportion of the site is shown to be at additional risk from Flood Zone 3b + climate change.

**If the LPA can state no development in Flood Zone 3b and the developer can ensure no development in Flood Zone 3b then areas of the site could still be allocated / developed. This should be written into local plan policy.**

It is important to state that it may still be possible to deliver a site that has been recommended for withdrawal from allocation upon more detailed investigation through a Level 2 SFRA and subsequent update of the Flood Zone 3b outline through more detailed modelling, if applicable.

Depending on local circumstances, if it is not possible to remove the developable area from Flood Zone 3b or the future Flood Zone 3b to a lower risk zone then development should not be allocated or permitted.

87 of the 403 potential development sites have been recommended for withdrawal, at this stage.

Any area within Flood Zone 3b must be left as open green space. For smaller sites, this approach is unlikely to be achievable compared to larger sites where there may be enough space to limit the impact through effective flood storage or blue green infrastructure. If this is not possible, the site should be withdrawn.

### 1.1.2 Strategic Recommendation B - Level 2 SFRA required. Exception Test may be required.

This strategic recommendation does not take into account local circumstances, only that part of the site area falls within a flood zone.

Strategic Recommendation B applies to any site where the following criteria is true:

- Any part of a site is within Flood Zone 3a
- Any part of a site is within Flood Zone 2
- Any part of a more vulnerable or less vulnerable site is within the high or medium risk surface water flood zones
- Any site modelled to be at additional risk from climate change

NOTE: the Exception Test only applies to sites at fluvial or tidal flood risk, depending on the vulnerability of the site use (see Table 2 of the FRCC-PPG). Less vulnerable (employment) uses of land do not require the Exception Test but may still require a Level 2 SFRA to show whether they can be safe for the lifetime of development.

Strategic Recommendation B applies to sites where a Level 2 SFRA is required. According to diagrams 1, 2 and 3 and Table 2 of the FRCC-PPG, any site at high or medium flood risk now and in the future should be assessed in more detail through a Level 2 SFRA.

A number of sites will be subject to application of the Exception Test through the Level 2 SFRA i.e. more vulnerable sites in Flood Zone 3a. The Sequential Test should have been passed first, using this Level 1 SFRA, before application of the Exception Test. The LPA should always attempt to avoid risk areas where possible.

Strategic Recommendation B applies to 246 of the 403 potential development sites assessed. 237 of these sites require a Level 2 SFRA to confirm surface water risk.

### 1.1.3 Strategic Recommendation C - allocate and progress to developer-led FRA

This strategic recommendation does not take into account local circumstances, only that part of the site area falls within a flood zone..

Strategic Recommendation C applies to any site where the following criteria is true:

- Any site within the low risk surface water flood zone
- Any site 100% within Flood Zone 1 and not shown to be at risk from medium or high risk surface water flooding, but is greater than 1 hectare in area

Strategic Recommendation C applies to six of the 403 potential development sites assessed. One of these is within the low surface water flood risk zone.

### 1.1.4 Strategic Recommendation D - development could be allocated on flood risk grounds based on the evidence of this Level 1 SFRA. LPA to make decision on allocation

Strategic Recommendation D applies to any site where the following criteria is true:

- Any site 100% within Flood Zone 1 and 100% at very low risk from surface water flooding, and less than 1 hectare in area
- Any site modelled to not be at additional risk from climate change

Strategic Recommendation D applies to 64 of the 403 potential development sites. Further investigation (i.e. FRA) may be required by the developer at the planning application stage if any further or new information becomes available since the publication of this Level 1 SFRA.

## 1.2 Assessment of climate change

The Site Assessment spreadsheet (Appendix C) highlights the additional risk to sites, where applicable, as a result of climate change. To represent the increased flood risk resulting from climate change in fluvially and tidally dominated scenarios, peak fluvial inflows and tidal boundaries were uplifted according to EA guidelines. The Central Lancashire Authority area is within two management catchments: the Douglas Management Catchment and Ribble Management Catchment. Table 1-5 indicates the climate change allowances applicable to the management catchments covering the study area.

Table 1-5: Climate change allowances for peak river flows

Climate change allowance	Douglas Management Catchment	Ribble Management Catchment
Central	35%	36%
Higher Central	47%	46%
Upper	79%	71%

The higher central climate change allowance for each management catchment has been applied to consider the impact on fluvial flood risk.

For tidally influenced models, climate change uplifts were applied to the tidal boundaries to represent the higher central allowances for the 2096 to 2125 epoch. These uplifts level rises were added to the 3.3% and 0.5% AEP events. The updated tidal curves include the rises due to storm surges. The inflow additions due to wave overtopping have also been modelled, however preserving the estimated in the existing models. Table 1-6 indicates the sea level allowances for the North West river basin district. The number in brackets is the cumulative sea level rise for each year within each range.

Table 1-6: Sea level allowances for the North West RBD

Allowance category	2000-2035 (mm)	2036-2065 (mm)	2066-2095 (mm)	2096-2125 (mm)	Cumulative rise 2000-2125 (m)
Upper end	5.7 (200)	9.9 (297)	14.2 (426)	16.3 (489)	1.41
Higher Central	4.5 (158)	7.3 (219)	10 (300)	11.2 (336)	1.01

At the time of writing, the following EA guidance should be followed:

Flood risk assessments: climate change allowances

The Site Assessment spreadsheet (Appendix C) highlights the **additional** risk from climate change. This has been assessed by clipping the baseline flood outlines from the climate change enhanced flood outlines for each return period, leaving an outline of the additional area at risk from flooding. This was screened against the potential development sites to identify sites at risk from climate change. The Risk of Flooding from Fluvial and Tidal Climate Change columns indicate the area of each site that intersects with each modelled flood outline.

The fluvial climate change scenarios assessed were:

- 1 in 30 year + central climate change allowance (functional floodplain + climate change)
- 1 in 100 year + higher central climate change allowance

The tidal climate change scenarios assessed were:

- 1 in 30 year + higher central climate change sea level allowance
- 1 in 100 year + higher central climate change sea level allowance

The impact of climate change on surface water flood risk has been assessed through uplifting the Risk of Flooding from Surface Water using the upper end peak rainfall intensity allowance.

The surface water climate change scenarios assessed were:

- 1 in 30 year + upper end climate change allowance
- 1 in 100 year + upper end climate change allowance

### 1.3 Summary of site assessment outcomes

There are several consequential development considerations which could come out of the site assessment sequential testing process. Each outcome is discussed below. The LPA should refer to Section 1.1 and Appendix C for details on the site assessments carried out for this SFRA.

#### 1.3.1 Rejection of site

A site which fails to pass the Sequential Test and/or the Exception Test should be rejected and development not permitted. Rejection would also apply to any sites within the functional floodplain (unless water compatible or essential infrastructure informed by a FRA).

However, if the developer can avoid or incorporate the functional floodplain, part of the site could still be delivered.

In terms of surface water flood risk, if risk is considered significant or where the size of the site does not allow for onsite storage or application or appropriate SuDS then such sites could be rejected. The LLFA will be best placed to advise on site-specific surface water flood risk and whether sites can be taken forward or not.

#### 1.3.2 Exception Test required

Applies to those sites that, according to diagrams 1, 2 and 3, and Table 2 of the FRCC-PPG, would require the Exception Test. Only less vulnerable land uses would not require the Exception Test in Flood Zone 3a. More vulnerable uses are only permitted if the Exception Test is passed and all development proposals in Flood Zone 3a, or at high or medium risk of surface water flooding, must be accompanied by a Flood Risk Assessment at the planning application stage. A Level 2 SFRA will inform the application of the Exception Test.

#### 1.3.3 Consideration of site layout and design

Site layout and site design is important to consider early on in the site planning stage where flood risk exists. The site area would have to be large enough to enable any alteration of the developable area of the site to remove development from a risk area, or to leave space for onsite storage of floodwater. Careful layout and design at the site planning stage may

apply to such sites where it is considered viable based on the level of risk. Surface water risk and opportunities for SuDS should also be assessed during the planning stage.

The Environmental Permitting (England and Wales) Regulations 2016 require a permit or exemption to be obtained for any activities which will take place:

- on or within 8 metres of a main river (16 metres if tidal)
- on or within 8 metres of a flood defence structure or culverted main river (16 metres if tidal)
- on or within 16 metres of a sea defence
- involving quarrying or excavation within 16 metres of any main river, flood defence (including a remote defence) or culvert
- in the floodplain of a main river if the activity could affect flood flow or storage and potential impacts are not controlled by a planning permission

Any development within 8 metres of any flood defence structure or culvert on a Main River is likely to be a regulated flood risk activity under Schedule 25 of the Environment Permitting (England and Wales) Regulations 2016. Any site redesign, where Flood Zone 3a is included within the site footprint, should allow water to flow naturally or be stored in times of flood. Similarly, any change or alteration to an ordinary watercourse within a site would need consent from the LLFA under the Land Drainage Act 1991<sup>3</sup>.

#### 1.3.4 Site-specific Flood Risk Assessment

A site-specific Flood Risk Assessment should assess whether a potential development is likely to be affected by current or future flooding, accounting for the impacts of climate change, from any source. This should include referencing this SFRA to establish sources of flooding. Further analysis should be performed to improve the understanding of flood risk including agreement with the LPA and the EA on areas of functional floodplain that may not have been robustly defined within this SFRA due to the absence of appropriate EA modelling information. The LLFA should be consulted on risk from surface water and from ordinary watercourses.

According to the FRCC-PPG (Para 020), a site-specific FRA is:

*“...carried out by (or on behalf of) a developer to assess the flood risk to and from a development site and should accompany a planning application where prescribed in footnote 55 of the National Planning Policy Framework. The assessment should demonstrate to the decision-maker how flood risk will be managed now and over the development’s lifetime, taking climate change into account, and with regard to the vulnerability of its users (see NPPF Annex 3 – Flood Risk Vulnerability)”.*

Possible mitigation measures for at risk sites include ensuring floor levels are raised a minimum of 600 mm above the critical design event flood level. Any proposals for lower finished flood levels would need to be based on site specific evidence presented in a FRA. However, compensatory flood storage must be found where the risk is fluvial.

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[3 Land Drainage Act | GOV.UK | 1991](#)

Compensatory flood storage must become effective at the same point in a flood event as the lost storage would have done. (McPherson 2002). It should therefore provide the same volume and be at the same level relative to flood level, as the lost storage<sup>4</sup>. If this cannot be achieved, it is for the applicant to identify alternative mitigation measures.

Stilted development is an option whereby floodwaters can flow more naturally without obstacles though this can prove to be a costly solution. The use of stilts or voids does not provide floodplain compensation, but rather mitigation of risk by design. Stilts do not guarantee that the floodplain will be retained in the same way as a compensation scheme (which is a form of risk substitution). The area beneath stilts is often used as storage and can be difficult to maintain due to the confined space. However, this option may be appropriate in some circumstances. Any site identified to be at residual risk must have suitable site access and escape routes available during times of flood together with a full emergency plan that should accompany the FRA at the application stage. The provisions of suitable flood warning systems should also be investigated.

For further detail regarding the requirements of a site specific FRA, refer to Section 5.6 of the main report.

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<sup>4</sup> [CIRIA January 2004, CIRIA Report 624: Development and Flood Risk - Guidance for the Construction Industry](#)

Detailed mitigation must be agreed through site-specific FRAs or through Level 2 SFRA's where it would be necessary to demonstrate site allocations would be safe for their lifetime.

When is a site-specific FRA required?

According to the NPPF footnote 63, a site-specific FRA should be prepared when the application is:

- Situated in Flood Zone 2 and 3; for all proposals for new development (including minor development and change of use);
- 1 hectare or greater in size and located in Flood Zone 1;
- Located in Flood Zone 1 on land which has been identified by the EA as having critical drainage problems (i.e. within an ACDP);
- Land identified in the SFRA as being at increased fluvial flood risk in future;
- At risk of flooding from other sources of flooding, such as those identified in this SFRA; or
- Subject to a change of use to a higher vulnerability classification which may be subject to other sources of flooding.

The LPA should also consider further options for stipulating FRA requirements, such as:

- At residual risk from flood defence breach, reservoir or canal failure; or
- Situated over a culverted watercourse or where development will require controlling the flow of any watercourse, drain or ditch or the development could potentially change structures known to influence flood flow.

These further options should be considered using the preparation and development of the Local Plan.

Paragraph 021 of the FRCC-PPG contains information regarding the level of detail required in the FRAs and indicates that it should always be proportionate to the degree of flood risk whilst making use of existing information, including this SFRA. Paragraph 080 of the FRCC-PPG contains an easy to follow FRA checklist for developers to follow.

Together with the information in the FRCC-PPG, there is further detail and support provided for the LPAs and developers via:

[Advice for developers](#)

[Advice for LPAs](#)

The Environment Agency have also produced guidance for Flood Risk Assessments for planning applications<sup>5</sup>.

### 1.3.5 Sites passing the Sequential and Exception Tests

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<sup>5</sup> [Flood risk assessments for planning applications | GOV.UK | February 2017](#)

Development sites can be allocated or granted planning permission where the Sequential Test and the Exception Test (if required) are passed and agreement is reached between the LPA/LLFA, the EA, the water companies and any ancillary stakeholders. In addition, a site is likely to be allocated without the need to assess flood risk where the indicative use is for open space. Assuming the site is not to include any development or land raising / regrading works and is to be left open in its original state then the allocation is likely to be acceptable from a flood risk point of view. However, for sites where there is potential for flood storage, options should be explored as part of a FRA.

In terms of opportunities for reducing flood risk overall as a requirement of the Exception Test, the FRCC-PPG states:

*“Developers should refer to the Strategic Flood Risk Assessments and site-specific Flood Risk Assessments to identify opportunities to reduce flood risk overall and to demonstrate that the measures go beyond just managing the flood risk resulting from the development. Reductions could be achieved, for example by:*

- *Incorporating green infrastructure within the layout and form of development to make additional space for the flow and storage of flood water;*
- *Providing Sustainable Drainage Systems, that manage flood risk beyond the proposed site and above the usual standard, such as by removing surface water from existing combined sewers;*
- *Providing or making contributions to flood risk management infrastructure that will provide additional benefits to existing communities and/or by safeguarding the land that would be needed to deliver it.” (Paragraph 37).*

### 1.3.6 Surface water flood risk to assessed sites

For sites at surface water flood risk, the following should be considered:

- More detailed surface water modelling may reveal increased risk or less risk to a site. The LLFA should be consulted when considering development viability at such sites;
- Outline drainage strategy to ascertain natural flow paths and topographic depressions, particularly for the larger sites which may influence sites elsewhere;
- A detailed site-specific FRA incorporating surface water flood risk management;
- Full drainage strategy encompassing detailed surface water modelling of proposed site layouts, attenuation areas, diversion of flow routes;
- Ensuring future maintenance of surface water and SuDS assets through s106 agreements;
- The size of development and the possibility of increased surface water flood risk caused by development on current greenfield land (where applicable) and cumulative impacts of this within specific areas;
- Management and re-use of surface water onsite, assuming the site is large enough to facilitate this and achieve effective mitigation. Effective surface water management should ensure risks on and off site are controlled;

- Larger sites could leave surface water flood-prone areas as open greenspace, incorporating social and environmental benefits;
- SuDS must be used where possible for all developments of more than one property, in accordance with Schedule 3 of the Flood and Water Management Act (FWMA). Appropriate SuDS may offer opportunities to control runoff to greenfield rates or better. Restrictions on surface water runoff from new development should be incorporated into the development planning stage. For brownfield sites, where current infrastructure may be staying in place, then runoff should attempt to mimic that of greenfield rates, unless it can be demonstrated that this is unachievable or hydraulically impractical. Developers should refer to the national 'non-statutory technical standards for sustainable drainage systems' and other guidance documents cited in the main report. Note that sites considered for surface water SuDS should not be in locations of fluvial flood risk unless they are designed to mitigate for both sources of risk;
- Runoff up to and including the 1 in 100 AEP event (1%) should be managed on-site where possible, including where accounting for climate change;
- Measures of source control should be required for development sites;
- Developers should be required to set part of their site aside for surface water management, to contribute to flood risk management in the wider area and supplement green infrastructure networks;
- Developers should be required to maximise permeable surfaces;
- Flow routes on new development where the sewerage system surcharges as a consequence of exceedance of the 1 in 30 AEP design event (3.3%) should be retained; and
- It may then be beneficial to carry out a local SWMP or drainage strategy for targeted locations with any known critical drainage problems. Investigation into the capacity of existing sewer systems would be required in order to identify critical parts of the system i.e. pinch points. Drainage model outputs could be obtained from the water company to confirm the critical parts of the drainage network and subsequent recommendations could then be made for future development i.e. strategic SuDS sites, parts of the drainage system where any new connections should be avoided, and parts of the system that may have any additional capacity and recommended runoff rates. A Water Cycle Study would help to inform this.

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